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E1J JGN

(56) Documents Cited
EP 0825053 A1 EP 0511871 A1 EP 0482901 A1
US 5561954 A US 5176420 A

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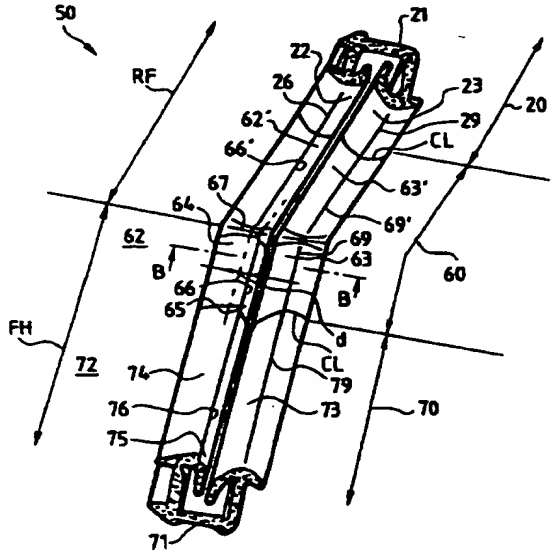
(54) Abstract Title
Window glass run

(57) A glass run for use in the corner portion of an automobile window frame comprises, a moulded glass run (60) having a pillar side portion and a roof side portion, with a bend between the two defining the boundary, and an extrusion moulded glass run (70) which is united with the pillar side portion of the moulded corner glass run. The pillar side portion of the corner unit has an outer lip (62) having a ridge (66), and the roof side portion also has similar features, outer lip (62') and ridge (66'). The extrusion moulded glass run also has an outer lip (72) and ridge (76), the latter being united with ridge (66) and shifted towards the glass pane with respect to ridge (66'). The shift in position of the ridge either side of the bend in the glass run with regards to the window pane is intended in use to prevent insufficient curvature of the glass run, and hence undesirable water and wind intrusion.

FIG.1



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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FIG.1

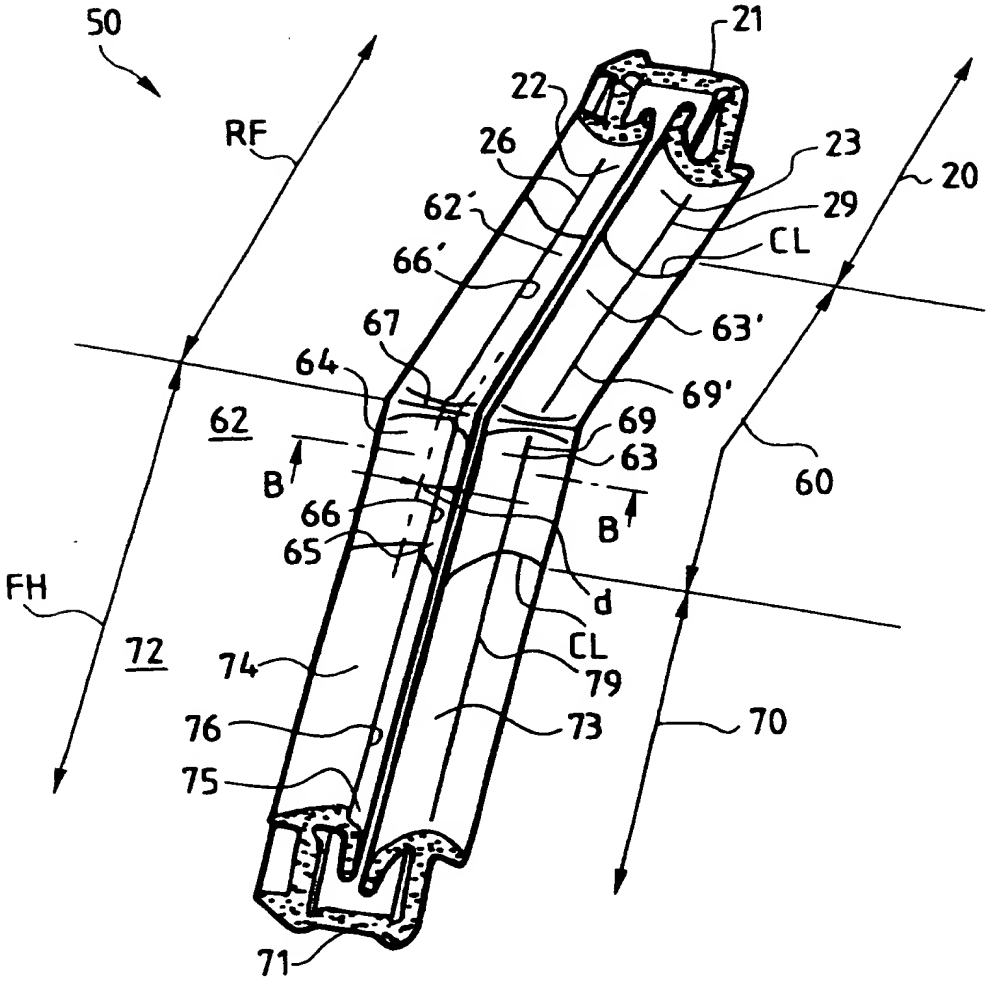

50
21
22
RF
26
23
20
62'
29
66'
CL
67
63'
64
69'
62
69
63
B
60
66
B
65
FH
d
72
74
CL
79
76
73
70
75
71

FIG. 2

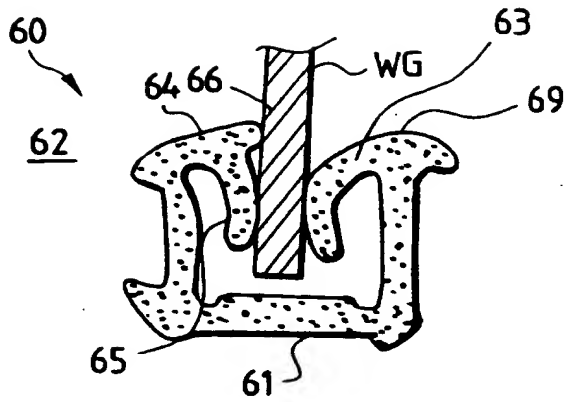

60
64
66
WG
63
69
62
65
61

FIG. 3

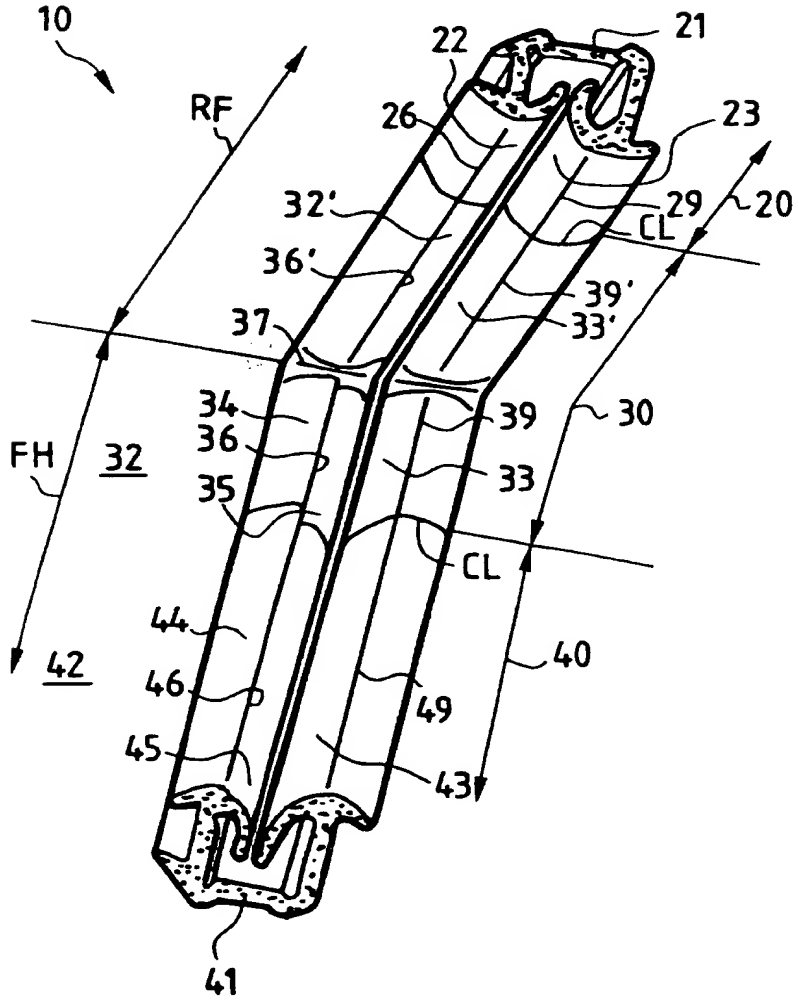

10
RF
22
21
26
23
32'
29
20
CL
36'
39'
37
33'
34
39
30
FH
32
36
33
35
CL
44
40
42
46
49
45
43
41

FIG.4

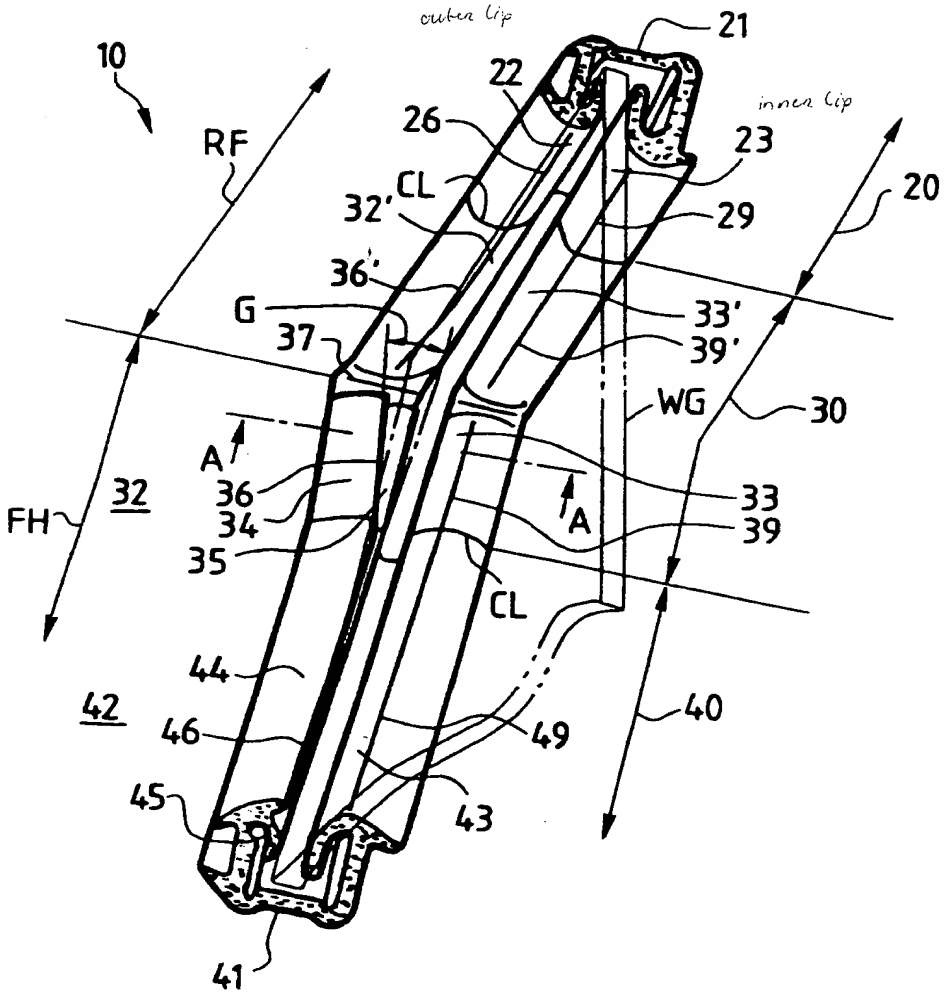


FIG.5

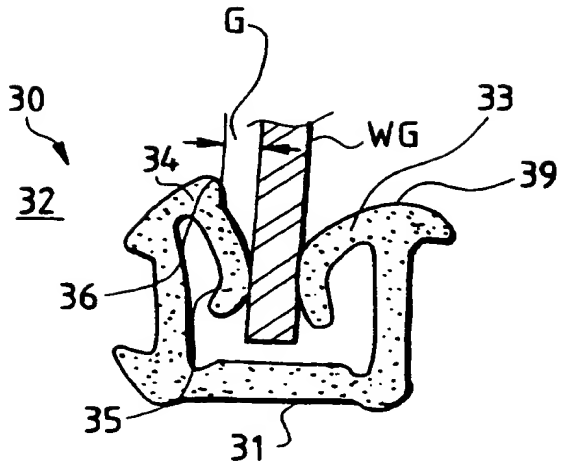
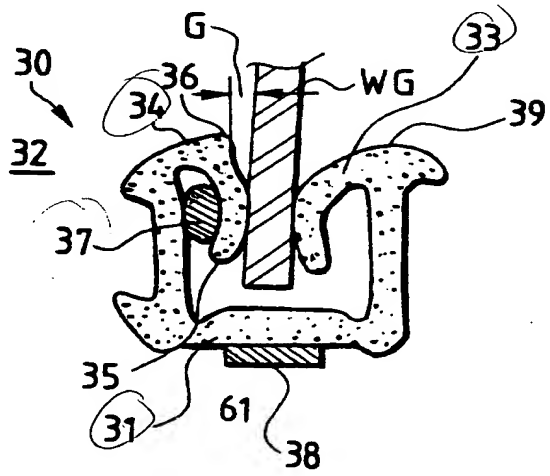


FIG.6



GLASS RUN

This invention relates to a glass run which can be arranged along the roof side, front, center and rear pillar sides, and front hinge side of a door panel or door sash. More particularly, the invention relates to a molded glass run and an extrusion-molded glass run which is applied to bend portions and the vicinity thereof and to the structures thereof.

Glass runs are generally composed such that their relatively long straight portions are constituted by an extrusion-molded glass run, and relatively short molded glass runs are connected to the front and rear end portions of the extrusion-molded glass run as bend portions, so that the glass run is fitted to the aimed door window glass plate periphery.

FIG. 3 is a perspective view showing the above-described bend portion 37 and its vicinity of a conventional glass run 10 which are arranged between the roof side RF and the front hinge side FH. Fig. 3 shows a state where the bend portion 37 is set free being disengaged from a window glass plate WG. FIG. 4 is a perspective view showing the main

parts in the aforementioned bend portion 37 and its vicinity at a state where the periphery of the window glass plate WG is sealed, except for some part, with outer lips 22, 32, 32' and 42 and inner lips 23, 33, 33' and 43.

The conventional glass run 10 shown in FIG. 3 is as follows: An extrusion-molded glass run 20 which is relatively long and straight is arranged on the roof side RF, an extrusion-molded glass run 40 which is relatively long and straight is arranged on the front hinge side FH, and a molded glass run 30 which is bent at a desired angle is arranged in the bend portion between the two extrusion-molded glass runs 20 and 40. The ends of those glass runs 20, 30 and 40 are connected to one another with adhesive agent or by vulcanization bonding simultaneously with molding.

The above-described glass runs 20 and 40 are slightly different in cross section because of the differences in their required functions attributed to the positions of arrangement. That is, the extrusion-molded glass run 20 on the roof side RF is substantially U-shaped in cross section, having a base bottom portion 21, and an outer lip 22 and an inner lip 23 which are curvedly protruded in confrontation with each other toward the inside of the base bottom portion 21. The outer lip 22 and the inner lip 23 each has a ridge at the vicinities of the upper end portions of the two side walls of the base bottom portion 21.

On the other hand, the extrusion-molded glass run 40 on the front hinge side FH is substantially U-shaped in cross section, having a base bottom portion 41, and an outer lip 42 and an inner lip 43 which are curvedly protruded in confrontation with each other toward the inside of the base bottom portion 41. The outer lip 42 and the inner lip 43 have ridges 46 and 49, respectively, at the upper end portions of the two side walls of the base bottom portion 41. The aforementioned inner lip 43 is substantially equal in cross section to the inner lip 23 of the extrusion-molded glass run 20 on the roof side RF. However, the outer lip 42 is different from the extrusion-molded glass run 20 on the roof side RF as follows. The aforementioned ridge 46 which is formed by the upper edge of the parting lip 44 located in the vehicle's exterior side is continuous to a window glass plate-sealing curved seal lip 45 which is set lower with some steps.

Accordingly, the molded glass run 30 connected between the extrusion-molded glass runs 20 and 40 having the above-described cross sections has different cross sections with the aforementioned bent portion 37 being the boundary, except for the common base bottom 31 and the inner lips 33 and 33'. That is, in the outer lip 32 on the front hinge side FH, similarly as in the case of the outer lip 42 of the extrusion-molded glass run 40 on the front hinge side FH, the

ridge 36 formed by the upper ridge of the parting lip 34 provided in the vehicle's exterior side is continuous to a window glass plate-sealing curved seal lip 35 which is set lower with some steps. In addition, the ridge 36 gradually shifts to the vehicle's exterior side so as to be continuous to the ridge 36' of the outer lip 32' on the roof side RF from the ridge 46 of the outer lip 42 on the front hinge side FH. In FIG. 3, reference numerals 39 and 39' denote the ridge of the front hinge side inner lip 33 and the ridge of the roof side inner lip 33', respectively.

The above-described conventional glass run 10 is as shown in FIG. 5 which is a sectional view taken along line A-A in FIG. 4. That is, when the window glass plate WG is raised and its periphery is inserted into the gaps which are formed by the end portions of the curved surfaces of the aforementioned outer lips 22, 32, 32' and 42 and those of the inner lips 23, 33, 33' and 43, which are fronted with the insides of the base bottoms 21, 31 and 41 in the upper end portions of the side walls of the base bottoms 21, 31 and 41, and then the curved surfaces of the outer lips 22, 32, 32' and 42 and of the inner lips 23, 33, 33' and 43 that are in contact with the surfaces of the window glass plate, while gradually increasing the degree of curvature (in other words, while sending the curved surfaces into the insides of the base bottoms 21, 31 and 41), increases the degree of close

contact with the surfaces of the window glass plate WG to obtain satisfactory sealing property with respect to the surfaces of the window glass plate WG.

However, the conventional glass run 10 causes differences in the degrees of curvature and inclination to the surfaces of the window glass plate WG and to the insides of the base bottoms 21, 31 and 41 due to the difference in cross section between the outer lip 32' and the parting lip 34 which are provided in the vicinity of the bent portion 37.

Especially, the parting lip 34 relatively high in rigidity is hard to curve and incline to the same extent as the outer lip 32' of the roof side RF. As a result, as shown in FIG. 5, an insufficient curvature region G is liable to be formed which is maximum in width near the bent portion 37 and gradually decreases in width towards the connection line CL with the extrusion-molded glass run 40 on the front hinge side FH.

If the aforementioned insufficient curvature region G is formed in the outer lip, particularly, in the ridges 36 and 46 of the parting lips 34 and 44 and the seal lips 35 and 45 around the front hinge side FH, provided in the vehicle's exterior side where much higher air-tightness and water-tightness are required than the inner lip which seals the window glass plate WG on the vehicle's interior side, then a

trouble such as noises, e.g., window whistling due to wind, and water leakage are liable to occur.

Means for suppressing the formation of the insufficient curvature region G has been proposed as follows. That is, as shown in FIG. 6, a round rod-shaped auxiliary member 37 is bonded to the curved inner surface of the outer lip 32, or a plate shaped auxiliary member 38 is bonded to the back surface of the base bottom 31, to increase the vehicle's exterior side in rigidity. However, with the means, it is difficult to completely eliminate the formation of the insufficient curvature region G which causes window whistling due to wind. Furthermore, in this case, the resistance to move the window glass plate WG up and down is increased. Hence, the above-described means is not suitable for eliminating the aforementioned trouble. In addition, the employment of the auxiliary member 37 or 38 results in an increase in manufacturing cost.

Accordingly, an object of the invention is to eliminate the above-described difficulties accompanying a conventional glass run. More specifically, an object of the invention is to provide a glass run which is compact and low in manufacturing cost and is free from a trouble such as the generation of window whistling due to wind and water leakage.

The foregoing object of the invention has been achieved by providing:

1) A glass run for use in a bent portion and the vicinities thereof of the peripheries of a window glass plate which are extended along the roof side, and the front, center and rear pillar sides of a door panel or door sash of a vehicle,

said glass run comprising:

a molded glass run (60) to be applied to a portion having a bent portion, said molded glass run (60) including a pillar side portion and a roof side portion with the bent being the boundary, said pillar side portion comprising an outer lip (62) having a ridge (66) and said roof side portion comprising an outer lip (62') having a ridge (66'); and

an extrusion-molded glass (70) which is united with the pillar side portion of said molded glass run (60) and which comprises an outer lip (72) having a ridge (76),

wherein said ridge (66) of the pillar side portion in said molded glass run (60) and said ridge (76) of said outer lip (72) in said extrusion-molded glass run (70) are shifted towards a window glass plate of a door to form a

predetermined shift from said ridge (66') of the roof side portion in said molded glass run (60).

2) The glass run according to the above 1), wherein said ridge (66) of the pillar side portion in said molded glass run (60) is continuous to said ridge (76) of said outer lip (72) in said extrusion-molded glass run (70) and these ridges (66, 76) are shifted towards said window glass plate WG of said door in the vicinity of the upper end portions thereof, so that a shift d which is substantially constant or gradually increases towards said outer lip (62') of the roof side portion in said molded glass run is formed with respect to said ridge (66') of the roof side portion in said molded glass run (60).

3) The glass run according to the above 1) or 2),

wherein said pillar side portion of said molded glass run (60) comprises a parting lip (64) and a curved seal lip (65), and said extrusion-molded glass run (70) comprises a parting lip (74) and a curved seal lip (75),

wherein said ridge (66) of the pillar side portion in said molded glass run (60) and said ridge (76) of said outer lip (72) in said extrusion-molded glass run (70) are each formed by the upper end portion of the respective parting lip (64, 74), and

wherein said parting lips (64 and 74) are, respectively, continuous to said curved seal lips (65 and 75)

which protrude, at a position slightly lower than said ridges (66 and 76) with steps, towards the vehicle's exterior side surface of said window glass plate WG.

4) The glass run according to any one of the above 1) to 3), wherein said pillar side is the front hinge side (FH).

5) The glass run according to any one of the above 1) to 4), wherein said shift d between said ridges is in a range of from 2 mm to 6 mm.

Since the glass run of the present invention has a structure as described in the above 1), when the window glass plate is raised, the outer rip in the pillar side portion of the molded glass run and the ridge thereof are brought into close contact with the vehicle's exterior side surface of the window glass with the degree of curvature smaller than that of the outer lip (on the pillar side) of the extrusion-molded glass run.

Furthermore, when the glass run of the present invention has a structure as described in the above 2), the respective outer lips on the pillar side are brought into close contact with the vehicle's exterior side surface of the window glass plate with the uniform degree of curvature.

Moreover, when the shift d (distance) between the ridges is set in a range of from 2 mm to 6 mm, prevention of the insufficient curvature region formation and the noise

generation, and maintenance of the sealing property are assured with higher reliability.

In the accompanying drawings:-

FIG. 1 is a perspective view showing main parts in a bend portion and its vicinity of a glass run of the invention, which is provided extending from a roof side to a front hinge side, and is in free state being disengaged from a window glass plate.

FIG. 2 is a sectional view taken along line B-B in FIG. 1.

FIG. 3 is a perspective view showing main parts in a bend portion and its vicinity of a conventional glass run, which is provided extending from a roof side to a front hinge side, and is in free state being disengaged from a window glass plate.

FIG. 4 is a perspective view showing main parts in the bend portion and its vicinity of the conventional glass run at a state where the window glass WG except for some parts is sealed.

FIG. 5 is a sectional view taken along line A-A in FIG. 4.

FIG. 6 is a sectional view taken along line A-A in FIG. 4, showing a modification thereof.

An embodiment of the glass run of the present invention is described below with reference to the accompanying drawings. FIG. 1 is a perspective view showing main parts in a bend portion 67 and its vicinity of the glass run, which is provided extending from a roof side RF to a front hinge side (the declinate portion which is extended downwardly to near the door mirror of the front door), and is in free state being disengaged from a window glass plate WG. FIG. 2 is a sectional view taken along line B-B in FIG. 1.

The glass run 50 according to the invention includes: a relatively long straight extrusion-molded glass run 20 on the roof side RF; a relatively long straight extrusion-molded glass run 70 on the front hinge side FH; and a molded glass run 60 which is incorporated between those glass runs 20 and 70 and has a bend portion 67 with a desired angle. The ends of those glass runs 20, 60 and 70 are bonded to one another with adhesive agent or by vulcanization-bonding simultaneously when molded.

The aforementioned extrusion-molded glass runs 20 and 70 are slightly different in section because they are different in their required functions depending on their positions. That is, the glass run 20 on the roof side RF is substantially U-shaped in section. The glass run 20 has a base bottom 21, and an outer lip 22 and an inner lip 23 which

are confronted with the inside of the base bottom 1, and are curvedly protruded with the upper ends of the side walls of the base bottom 21 being ridges 26 and 29.

On the other hand, the extrusion-molded glass run 70 on the front hinge side FH is substantially U-shaped in section. The glass run 70 has a base bottom 71, and an outer lip 72 and an inner lip 73 which are confronted with the inside of the base bottom 1, and are curvedly protruded with the upper ends of the side walls of the base bottom 71 being ridges 76 and 79. The inner lip 73 is substantially equal in cross section to the inner lip 23 of the extrusion-molded glass run 20 on the roof side RF; however, the outer lips 72 is different from the extrusion-molded glass run 20 on the roof side RF in that the ridge 76 formed by the upper edge of the parting lip 74 located in the vehicle's exterior side is continuous to a window glass plate-sealing curved seal lip 75 which is set low with some steps.

Accordingly, a molded glass run 60 connected between the extrusion-molded glass runs 20 and 70 having the above-described cross sections, has different cross sections with the aforementioned bent portion 67 being the boundary, except for the common base bottom 61 and inner lips 63 and 63'. That is, in the outer lip 62 on the front hinge side FH, similarly as in the case of the outer lip 72 of the extrusion-molded glass run 70 on the front hinge side FH, the

ridge 66 formed by the upper ridge of the parting lip 64 provided in the vehicle's exterior side is continuous to a window glass plate-sealing curved seal lip 65 which is set low with some steps.

In the glass run according to the present invention 50, the ridge 66 of the pillar side outer lip 62 in the molded glass run 60 and the ridge 76 of the outer lip 72 in the extrusion-molded glass run 70 located on the pillar side are shifted towards the window glass plate WG of the door to form a predetermined shift (difference) d with the ridge 66' of the roof side outer lip 62' in the molded glass run 60.

More preferably, the ridge 66 of the pillar side outer lip 62 in the molded glass run 60 is substantially on the same line as the ridge 76 of the outer lip 72 in the extrusion-molded glass run 70, and these ridges 66 and 76 are shifted towards the window glass plate WG of the door to form a shift d with the ridge 66' of the roof side outer lip 62' in the molded glass run 60.

The shift d may be gradually increased towards the outer lip 62', to thereby gradually decreases the height of the ridge 66 in the pillar side outer lip 62 of the molded glass run 60, towards the sloped surface of the roof side outer lip 62' in the molded glass run 60, when the window glass plate WG is inserted therein.

When the pillar side outer lip 62 of the molded glass run 60, and the pillar side outer lip 72 of the extrusion-molded glass run 70 are arranged on the front hinge side FH, it provides the highest effect of preventing the generation of window whistling due to wind. However, the invention is not limited to such application. For instance, those outer lips may be arranged on the center or rear pillar side.

In FIG. 1, reference numerals 69 and 69' denote the ridge of the front hinge side inner lip 63 and the ridge of the roof side inner lip 63', respectively.

As is apparent from the above description, the glass run of the invention has the following effects or merits.

When the window glass plate is raised, the outer rip in the pillar side portion of the molded glass run and the ridge thereof are brought into close contact with the vehicle's exterior side surface of the window glass with the degree of curvature smaller than that of the outer lip (on the pillar side) of the extrusion-molded glass run.

Furthermore, when the glass run of the present invention has a structure as described in the above 2), the respective outer lips on the pillar side are brought into close contact with the vehicle's exterior side surface of the window glass plate with the uniform degree of curvature.

Moreover, when the shift d (distance) between the ridges is set in a range of from 2 mm to 6 mm, prevention of

the insufficient curvature region formation and the noise generation, and maintenance of the sealing property are assured with higher reliability.

In the present invention, the object can be achieved merely by forming the predetermined shift between the ridges. Hence, the increase in cost concerning raw materials, molding and assembling works can be suppressed.

CLAIMS

1. A glass run for use in a bent portion and the vicinities thereof of the peripheries of a window glass plate which are extended along the roof side, and the front, center and rear pillar sides of a door panel or door sash of a vehicle,

said glass run comprising:

a molded glass run to be applied to a portion having a bent portion, said molded glass run including a pillar side portion and a roof side portion with the bent being the boundary, said pillar side portion comprising an outer lip having a ridge and said roof side portion comprising an outer lip having a ridge; and

an extrusion-molded glass which is united with the pillar side portion of said molded glass run and which comprises an outer lip having a ridge,

wherein said ridge of the pillar side portion in said molded glass run and said ridge of said outer lip in said extrusion-molded glass run are shifted towards a window glass plate of a door to form a predetermined shift from said ridge of said roof side portion in said molded glass run.

2. The glass run according to claim 1, wherein said ridge of the pillar side portion in said molded glass run is

continuous to said ridge of said outer lip in said extrusion-molded glass run and these ridges are shifted towards said window glass plate WG of said door in the vicinity of the upper end portions thereof, so that a shift d which is substantially constant or gradually increases towards said outer lip of the roof side portion in said molded glass run is formed with respect to said ridge of said roof side portion in said molded glass run.

3. The glass run according to claim 1 or 2,

wherein said pillar side portion of said molded glass run comprises a parting lip and a curved seal lip, and said extrusion-molded glass run comprises a parting lip and a curved seal lip,

wherein said ridge of the pillar side portion in said molded glass run and said ridge of said outer lip in said extrusion-molded glass run are each formed by the upper end portion of the respective parting lip, and

wherein said parting lips are, respectively, continuous to said curved seal lips which protrude, at a position slightly lower than said ridges with steps, towards the vehicle's exterior side surface of said window glass plate WG.

4. The glass run according to any one of claims 1 to 3, wherein said pillar side is the front hinge side.

5. The glass run according to any one of claims 1 to 4, wherein said shift d between said ridges is in a range of from 2 mm to 6 mm.

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Application No: GB 9902905.0 **Examiner:** P. Gardiner
Claims searched: 1 - 5 **Date of search:** 21 May 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): E1J: JGM, JGN
E1R: RRB, RRC, RRE, RRL, RRQ, RRT

Int Cl (Ed.6): B60J, E06B

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	EP 0825053 A1	KINUGAWA & TOKIWA (e.g. Fig.11)	1-5
X	EP 0511871 A1	TOKAI KKK (e.g. Fig.1)	1,2,4,5
X	EP 0482901 A1	TOKAI KKK (e.g. Fig.14)	1,2,4,5
X	US 5561954 A	NIFCO Inc. (e.g. Fig.6)	1-5
X	US 5176420 A	TOKIWA (e.g. Fig.14)	1,2,4,5

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.